EAS Journal of Dentistry and Oral Medicine
Abbreviated Key Title: EAS J Dent Oral Med
ISSN: 2663-1849 (Print) & ISSN: 2663-7324 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-7 | Issue-4 | Jul-Aug-2025 | DOI: https://doi.org/10.36349/easjdom.2025.v07i04.006

Case Report

Flabby Ridge Management in Edentulous Patients: From Impression to Prosthesis

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Article History
Received: 28.05.2025
Accepted: 07.07.2025
Published: 12.07.2025

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Flabby ridges are a common challenge in the prosthetic rehabilitation of edentulous patients. These mobile, hyperplastic tissues compromise denture stability and retention, leading to patient discomfort and functional limitations. This case report describes the management of an 81-year-old edentulous patient presenting with flabby maxillary tissues. The proposed treatment included a combined surgical and prosthetic approach. A specific impression technique was used to accurately record the flabby tissues with minimal displacement, employing selective pressure. Surgical intervention involved vestibuloplasty and excision of the hyperplastic mucosa, guided by a transparent duplicate of the prosthesis serving as a surgical guide. Post-surgical stabilization was achieved using a tissue conditioner applied to the final prosthesis, which was placed immediately after surgery. The healing process was monitored at regular intervals, and satisfactory outcomes were obtained with prosthesis stability, and patient satisfaction. This case illustrates the value of a multidisciplinary approach combining careful diagnosis, patient-specific impression techniques, and surgical precision to manage flabby ridges effectively and restore prosthetic function in edentulous patients.

Keywords: Flabby Ridge, Prosthodontic Rehabilitation, Edentulism, Impression Techniques, Window Technique, Surgical Approaches.

INTRODUCTION

The success of a complete denture prosthesis is often determined by its retention, stability, and support during function. Ideally, the residual ridge should be covered with a 1.5-2 mm layer of the masticatory mucosa to provide sufficient soft tissue support for the denture. In cases of a flabby ridge, the normal tissue support is absent, and instead, there is highly movable soft tissue on the surface of the alveolar ridge (Swati *et al*., 2024). Leading to an unstable denture positioning and dissatisfaction for the wearer while also compromising the quality of the denture bearing tissue. Therefore, proper prosthodontic management is essential to restoring the patient's function, esthetics, and speech (Deshmukh *et al*., 2024).

The purpose of this manuscript is to present the management of flabby tissue on an edentulous patient with special impression techniques followed by a surgical intervention.

CASE REPORT

An 81-year-old man with a medical history of hypertension, heart disease, asthma, and a penicillin allergy, was referred to the Department of Prosthodontics at the Faculty of Dental Medicine in Monastir, Tunisia, seeking a new set of complete removable dentures.

He had been wearing a complete removable denture for the past 10 years.

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Extraoral examination revealed a collapse of the lower third of the face, a significant reduction in occlusal vertical dimension (OVD), angular cheilitis, a pouch-like appearance of the cheeks, and pronounced nasolabial folds and facial wrinkles (figure 1).

Figure 1: Angular cheilitis

The intraoral Examination revealed a flabby ridge, at the maxillary level. It consists of a thick, fibrous, mobile tissue, extending from canine to canine, not adherent to the underlying structures. The overlying mucosa appears non-inflamed, and firm on palpation (Figure 2).

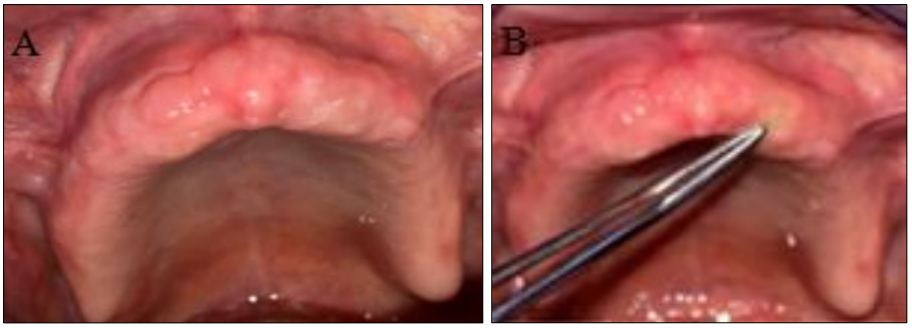

Figure 2: A: Pre-rehabilitative intraoral view of maxillary, B: Flabby tissues in maxillary

The radiograph reveals severe maxillary bone resorption (Figure 3).

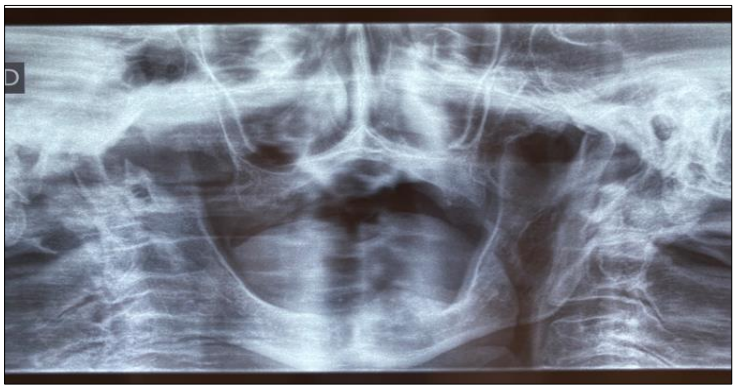

Figure 3: Radiological examination

Following the examination, a combined surgical and prosthetic treatment plan was proposed to the patient: A new complete prosthesis was planned for this patient concomitantly with a vestibuloplasty to restore anterior alveolar ridge height.

The treatment included oral hygiene motivation and instruction, a prosthetic phase involving specific impression techniques and a surgical excision of the flabby ridge followed by a healing and stabilization phase.

The patient was informed in detail about the procedure, and his consent was obtained.

The preliminary impressions were made using impression alginate and were poured using a white dental plaster (figure 4).

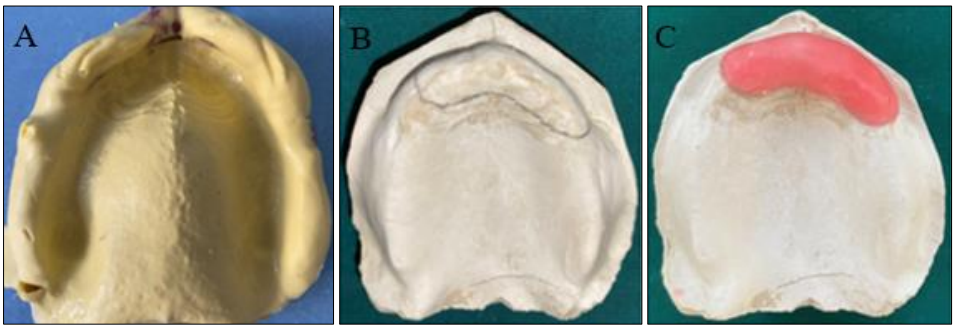

Figure 4: A: Primary impressions with irreversible hydrocolloid, B and C: The hyperplastic maxillary area delineation scribed on the preliminary cast.

The mobile tissue was precisely identified by palpation and spotted on the cast. A 3 mm-thick layer of wax was then applied over the hyperplastic maxillary area to block it out, compensating for the compression caused by the alginate and creating a spacment for the secondary impression tray (Figure 4 C). The custom tray was fabricated using self-curing resin.

Two occlusion rims were shaped and adjusted to register the centric relation at the appropriate occlusal vertical dimension. Border molding was performed using putty polyvinylsiloxane. Once retention was verified, relief holes were made in the custom tray regarding the hyperplastic area using a round bur, allowing excess impression material to escape. The final impression was taken using a polyether material (medium viscosity) under functional pressure, with the patient gently guided into centric relation at the correct occlusal vertical dimension until the material had completely set (Figures 5(A)–5(C)).

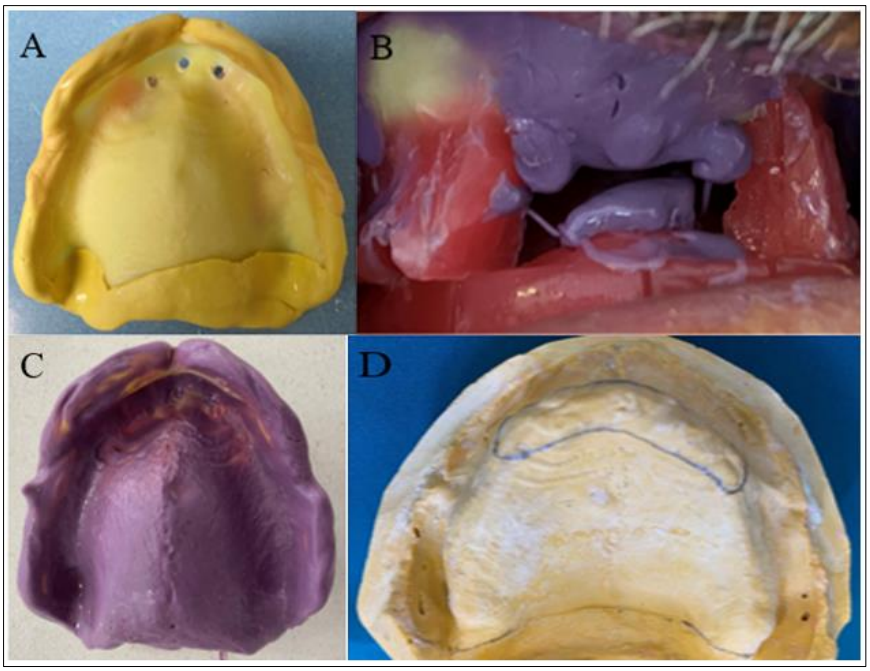

Figure 5: Secondary impression. A: Perforations corresponding to the hyperplastic area, B: Final impression under occlusal pressure, C: Secondary impression with polyether, D: secondary cast

Before manufacturing the final prostheses and after teeth mounting try in and validation, surgical procedures must be simulated on the final cast by scarping the amount of plaster corresponding to the ulterior removed tissue (flabby mucosa) since the prosthesis will be placed in the mouth the day of surgery, directly onto operated surfaces (Figure 6).

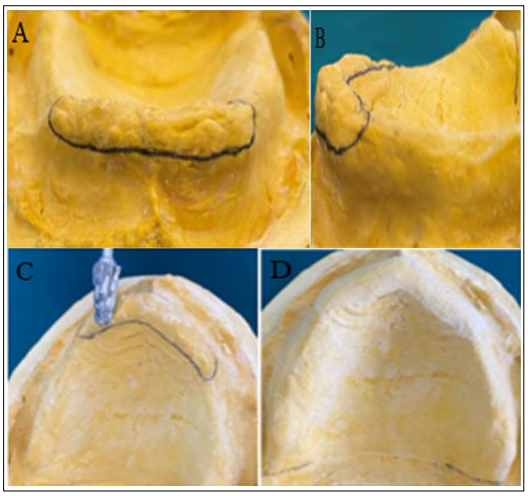

Figure 6: A, B, C, D: Surgery simulation

After manufacturing, the final maxillary prosthesis must be duplicated with transparent resin which served as a surgical guide (Figure 7). This duplicate is an exact replica of the maxillary prosthesis.

Figure 7: Prosthesis duplication

The excision of flabby tissue was performed with the conventional surgical procedure that was controlled by the surgical guide until obtaining the wanted width of the vestibule (Figures 8(A)–8(D)).

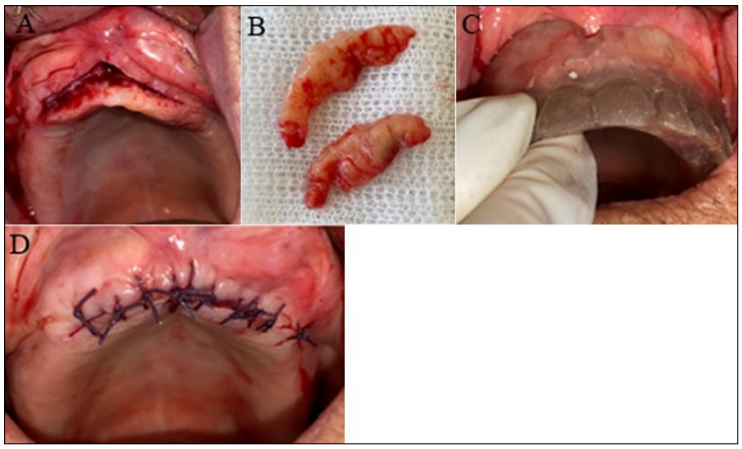

Figure 8: Surgical procedure. A: excision using conventional scalpel surgery, B: removed mucosa, C: surgery control using surgical guide, D: suture

Immediately, the upper prothesis was carefully relined with a soft tissue conditioner under occlusal pressure (Fitt, Kerr ®) to stabilize the prosthesis and facilitate wound healing (Figure 9).

The patient was instructed to wear the maxillary prosthesis continuously for two days without removing it, in order to guide the healing process.

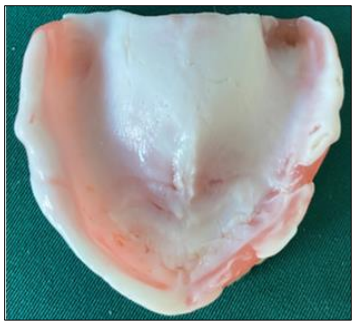

Figure 9: Molded soft tissue conditioner.

Antibiotics and analgesics were prescribed for 7 days.

The patient was recalled after 3 days, 7 days, and 2 weeks for observation and reapplying the soft tissue conditioner. The healing was satisfactory, and no postoperative pain or edema was reported. After 30 days, perfect healing was achieved.

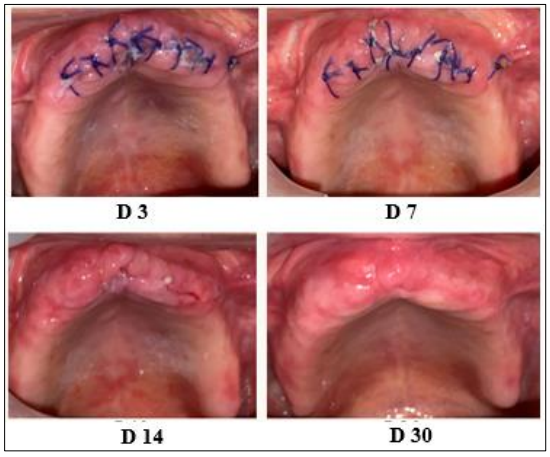

Figure 10: Healing after 3 days, 7 days, 2 weeks and 1 month

After 60 days, a relaining impression was taken using the maxillary denture. Border molding was done using a green stick compound (Kerr Impression Compound Green®). Holes were created in the anterior region and the impression was taken using a low-viscosity material (light silicone) under occlusal pressure with correct centric relation (CR) and vertical dimension (VD) (Figure 11).

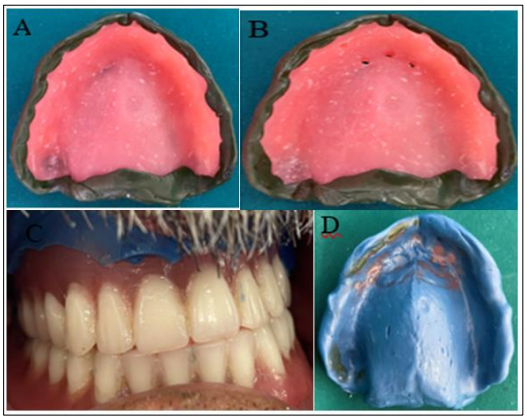

Figure 11: A: Border molding using a green stick compound (Kerr Impression Compound Green®), B: Perforations, C: impression under occlusal pressure, D: Impression using light silicone

DISCUSSION

A flabby ridge refers to an area of hypermobile and highly resilient soft tissue affecting up to 24% of edentulous maxillary ridges and 5% of edentulous mandibular ridges, with the anterior maxilla being the most commonly affected site (Algabri *et al*., 2023). It typically develops when excessive masticatory pressure or unstable occlusion leads to accelerated bone resorption, followed by the replacement of the lost

alveolar bone with hyperplastic fibrous tissue. According to Kelly (as cited in Algabri *et al*., 2023), the cause of lesions in edentulous tissues is commonly attributed solely to ill-fitting dentures. The mucosal tissue underlying the prosthetic surfaces is mobile and lacks firmness, making removable denture retention, support, and stability particularly challenging (Algabri *et al*., 2023).

There are different approaches for managing flabby ridges during prosthetic fabrication, as reported by Singh *et al*., (2022). During impression making of the flabby ridge, the soft tissue is displaced by the impression material. However, the fibrous tissue underlying the flabby ridge tends to spring back or recoil to its original position once the impression is removed, which may result in denture displacement later. In fact, while the impression process temporarily displaces the soft tissue, the inherent elasticity of the fibrous tissue allows it to return to its original position, which in turn influences the fit and placement of the final denture (Singh, Patil, & Datta, 2022). Therefore, there is a need for recording the tissues in a physiological state and an assessment of the correct technique and material is required (Lalwani *et al*., 2024).

Srivastava *et al*., (2019) highlighted that traditional impression techniques may compromise denture retention and stability in patients with flabby tissue. The modified custom-made trays with a minimally displacive technique were proposed as an alternative approach for managing these patients.

In a study conducted by Shin *et al*., (2019) they compared different tray designs to assess their impact on the displacement of flabby tissue during maxillary edentulous impressions. The tray designs included conventional relief, additional relief, and an open window. The researchers found that trays with additional relief minimized lateral displacement of the flabby tissue, while trays with an open window resulted in the least overall displacement of the flabby tissue. In a recent study, Colvenkar *et al*., (2023) reported that the window technique exerts little to no pressure on the flabby tissue.

The impression philosophy is based on the selective pressure technique, in which certain denture-bearing tissues are intentionally compressed in a selective manner (Gnanam *et al*., 2024).

Comut and Andrawis (2015) state that the choice of material and technique are critical factors for obtaining an accurate impression of both the firmly attached and excessively mobile tissues. In cases of localized flabby mucosa, Labban (2018) described a technique specifically designed for recording anterior maxillary flabby tissues. This method involves using a vacuum-pressed polyethylene sheet to create a relief area within the impression tray, allowing better control over the application of the PVS impression material.

For patients with excessively mobile flabby mucosa, authors recommend using two different impression materials to achieve an accurate recording of both tissue types : the firmly attached mucosa is captured using zinc oxide eugenol (ZOE) or medium-bodied silicone, while the flabby mucosa is recorded with plaster or light-bodied silicone (Singh *et al*., 2022; Deogade & Gupta, 2017).

Regarding the impression technique itself, Shum and Pow (2014), as well as Comut and Andrawis (2015), reported a modified approach for recording excessively mobile flabby mucosa. They used a custom tray modified with either perforations or a full window in the area of the flabby tissues. A definitive impression was then made using a single impression material : regular-body polyvinylsiloxane (PVS).

Hobkirk (2024) describes two window techniques for making impression of the flabby ridges. One of them uses impression plaster as the material of choice for making the impression of the fibrous tissues through a window in the special tray. The other technique describes a two-step technique where an initial impression is made using a viscous consistency elastomeric impression material followed by drilling holes through the custom tray in the region of fibrous tissues and making an impression of the flabby ridge using light body impression material (Rathee *et al*.,2024; Lalwani *et al*., 2024).

In addition to prosthetic procedures, surgical solutions can be employed to manage flabby ridges. These approaches include the subtractive technique, which involves excision of the flabby tissue, and the augmentation technique, where bone grafts are used to increase the height of the residual alveolar ridge. Removal of the flabby tissue can be performed using conventional scalpel surgery, involving two converging incisions toward the crest of the ridge to create a wedge-shaped segment often referred to as an "orange wedge," or by laser surgery, which offers several advantages, including high cutting precision, excellent hemostasis, cauterizing effects that promote favorable secondary intention healing, and reduced postoperative pain and swelling (Tayari, Jemli, & Jaouadi, 2019).

The surgical procedure is guided by a transparent resin base, called a prosthetic replica, which helps ensure optimal adaptation of the intaglio surface of the future denture to the post-surgical supporting tissues. The lesion is accurately targeted using the surgical guide, which highlights compression zones through tissue blanching, thereby indicating the precise areas to be excised. In fact, Shum and Pow (2014) fabricated a transparent baseplate from heat-polymerized acrylic resin to assess its fit, retention, and stability. Similarly, Imran (2018) emphasized the importance of using a transparent acrylic denture base to visualize pressure distribution and minimize the risk of displacement.

The guarantee of successful outcomes relies on proper follow-up. Ensuring the health of the oral tissues is essential for achieving a well-fitting denture, optimal adaptation, and overall stability. As reported by Mizouri *et al*., (2016), cleaning and maintaining the mucosal tissues is a critical first step in successfully fabricating a functional and stable complete denture.

CONCLUSION

Flabby tissue presents a challenging situation in the rehabilitation of completely edentulous patients. The choice of treatment ultimately depends on the patient's willingness to invest time and financial resources, their oral condition, ability to maintain good oral hygiene, and preference for a fixed or removable prosthesis.

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Cite This Article: Selma Snène, Oumaima Tayari, Nawel Berchèche, Jamila Jouadi (2025). Flabby Ridge Management in Edentulous Patients: From Impression to Prosthesis. *EAS J Dent Oral Med, 7*(4), 156-162.